IN THE CLAIMS:

Claims 1-14 (Canceled)

15. (Currently Amended) Method for hydration of a particulate or pulverulent material containing CaO, the method comprising:

adding water to a particulate or pulverulent material containing CaO, ~~whereing~~ wherein the water is added in a quantity which will ensure that the partial pressure P_{H2O} of the added water as a function of the temperature (°C) is maintained within the interval defined by the formula

$$6{,}85 - \frac{5459}{(T+273)} < \log P_{H,O} < 5{,}45 - \frac{2032}{(T+273)},$$

where P_{H2O} is the partial pressure of water vapor in atm. and T is the temperature in °C, and wherein the hydration of CaO takes place in an atmosphere containing the maximum amount of water vapor in which the temperature is maintained above 200°C and the partial pressure of the water vapor is from 0.9 to 1.1 atm.

16. (Previously Presented) Method according to claim 15, wherein the material containing CaO as well as the water are introduced into an upper end of a vertical reactor, directed down through the latter subject to simultaneous vaporization and hydration, and that the hydrated product is discharged from the reactor at a lower end thereof.

17. (Previously Presented) Method according to claim 15, wherein the material containing CaO is introduced into an upper end of a vertical reactor, directed down through the latter subject to simultaneous hydration with water which is introduced at a number of locations distributed across the height of the reactor, where any surplus water in vapour form is discharged through an opening in the upper end of the reactor and wherein the hydrated product is discharged from the reactor from a lower end thereof.

Claims 18-23 (Cancelled)

24. (Previously Presented) Method according to claim 15, wherein the temperature during the hydration process is maintained at a level above 250°C.

Claims 25-35 (Cancelled)

36. (Currently Amended) Method according to claims 15, wherein some of the hydrated product is ~~recirculated~~ supplied to a hydration unit.

37. (Cancelled)

38. (Cancelled)

39. (Previously Presented) Method according to claim 15, wherein hydration is confined to the surface of the material particles.

40. (Previously Presented) Method according to claim 39, wherein the degree of hydration is less than 70 %.

41. (Previously Presented) Method according to claim 39, wherein the degree of hydration is less than 50 %.

42. (Previously Presented) Method according to claim 15, further comprising extracting the material containing CaO in the form of calcined raw meal from a calciner of a cement manufacturing plant.

43. (Currently Amended) Method according to claim 42, wherein the hydrated product subsequently is introduced ~~re-introduced~~ into a preheater of the cement manufacturing plant immediately after the location, viewed in the direction of movement of the exhaust gases, where SO_2 is formed in order to absorb SO_2.

Claims 44-47 (Cancelled)

48. (New) Method for hydrating CaO to form particles comprising $Ca(OH)_2$, the method comprising:

adding particles comprising CaO to an upper end of a vertical reactor to form a particle flow down through the vertical reactor;

adding water to the downward flow of particles, wherein the temperature of the particle flow where the water is added is maintained above 200°C so that the water is converted to water vapor, the water being added in an amount to maintain a water vapor partial pressure of 0.9 to 1.1 atmosphere such that the hydration reaction is between the CaO and the water vapor to form particles comprising $Ca(OH)_2$ that are substantially free of agglomerates;

allowing excess water vapor to escape from the upper end of the vertical reactor; and

discharging the particles comprising $Ca(OH)_2$ from a lower end of the vertical reactor.

49. (New) The method according to claim 48, wherein the reaction is conducted so that the hydration of outer surface of the particles comprising $Ca(HO)_2$ is greater than the hydration inside the particles.

50. (New) The method according to claim 49, wherein the degree of hydration is less than 70 %.

51. (New) The method according to claim 49, wherein the degree of hydration is less than 50 %.

52. (New) The method according to claim 48, wherein the particles comprising CaO comprises a calcined raw meal extracted from a calciner of a cement manufacturing plant.

53. (New) The method according to claim 48, wherein the heat energy for forming the water vapor from the water is provided by the particles comprising CaO.

54. (New) Method for reducing the amount of SO_2 discharged from a kiln of a cement manufacturing plant, the method comprising:

adding particles comprising CaO formed from a calcined raw meal extracted from a calciner of a cement manufacturing plant to an upper end of a vertical reactor to form a particle flow down through the vertical reactor;

adding water to the downward flow of particles, wherein the temperature of the particle flow where the water is added is maintained above 200°C so that the water is converted to water vapor, the water being added in an amount to maintain a water vapor partial pressure of 0.9 to 1.1 atmosphere such that the hydration reaction is between the CaO and the water vapor to form particles comprising $Ca(OH)_2$ that are substantially free of agglomerates, and a greater concentration of $Ca(OH)_2$ on the surface than the inside of the particles comprising $Ca(OH)_2$;

allowing excess water vapor to escape from the upper end of the vertical reactor;

discharging the particles comprising $Ca(OH)_2$ from a lower end of the vertical reactor; and

supplying at least a portion of the particles comprising $Ca(OH)_2$ to a discharge from a kiln containing SO_2 such that the SO_2 reacts with the $Ca(OH)_2$ to reduce the amount of SO_2 discharged.

55. (New) The method according to claim 53, wherein the degree of hydration is less than 70 %.

56. (New) The method according to claim 53, wherein the degree of hydration is less than 50 %.

57. (New) The method according to claim 53, wherein the heat energy for forming the water vapor from the water is provided by the particles comprising CaO.